

Attorney Docket: K-2081  
S.N.: 10/766,396

Amendments to the Specification

Please replace Paragraph [0006] with the following:

[0006] During machining operations, a work piece 102 is generally held by a chuck 122 with chuck jaws 124 for rotational rotation in the direction, W, in a manner known in the art. When the work piece 102 is installed in the chuck jaws 124, the work piece 122 has a longitudinal axis, LW, along its centerline that is perpendicular to the longitudinal axis, LT, or centerline of the toolholder 104. It should also be noted that the direction of cut, as shown by the arrow, is along the Z-axis and is parallel to the longitudinal axis, LW, or centerline of the work piece 122 and perpendicular to the longitudinal axis, LT, or centerline of the toolholder 104. In addition, it should be noted that the centerline, LT, of the toolholder 104 and the rotational axis, CT<sub>2</sub>, of the tool rest 110 corresponds to the axis, P, perpendicular to the centerline, LW, of the work piece 102.

Please replace Paragraph [0015] with the following:

[0015] The zero centerline configuration of the toolholder assembly 10 of the invention is accomplished by tilting the tool spindle 106 and the spindle housing 108 at a fixed, non-zero angle,  $\delta$ , with respect to the axis, P, depending on the tool configuration and the geometry of the cutting insert 102. That is, the zero centerline configuration of the toolholder assembly 10 is accomplished by tilting the tool spindle 106 and the spindle housing 108 at a fixed, non-perpendicular angle,  $\delta$ , with respect to the longitudinal axis, LW, of the workpiece 120. Further, the rotational axis, CT<sub>2</sub>, of the tool rest 110 may be aligned with the center, RC, of the nose radius 102a of the cutting insert 102 and the centerline, LT, of the toolholder 104. By contrast, the center, RC, of the nose radius 102a of the cutting insert 102 of the conventional toolholder 100 does not lie on the centerline, LT, of the toolholder 104. Further, the centerline, LT, of the toolholder 104 is parallel to (i.e., lies on) the axis, P. As a result of the zero centerline configuration of the toolholder assembly 10 of the invention, and the angle,  $\delta$ , at which the toolholder 104 and cutting insert 102 is configured with the respect to the axis, P, the torque on the toolholder assembly 10 and the

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deflection of the cutting insert 102 during machining operations is greatly reduced or virtually eliminated.

Please replace Paragraph [0022] with the following:

[0022] As described above, the toolholder assembly 10 of the invention provides a zero centerline toolholder configuration in which the center, RC, of the nose radius 102a of the cutting insert 102 and the centerline, LT, of the toolholder 104 are aligned with each other (i.e., the center, RC, lies on the centerline, LT). In addition, the center, RC, and the centerline, LT, are also aligned with the rotational axis, CT<sub>2</sub>, of the tool rest 110. The centerline, LT, of the toolholder 104 form a fixed, non-zero angle,  $\delta$ , with respect the axis, P, which is substantially perpendicular to the centerline, LW, of the work piece 102. By locating the center, RC, of the nose radius 102a of the cutting insert 102 on the centerline, LT, of the toolholder 104, the radial component of the torque load is eliminated and torque loading of the joint between the toolholder 104 and the tool spindle 106 is minimized. In addition, the zero centerline configuration ensures that the nose radius 102a of the cutting insert 102 is properly located in the cutting plane and maintains proper alignment with the centerline, LT, of the toolholder 104 during machining operations. Further, the shorter tool length, L, of the toolholder assembly 10 of the invention reduces deflection of the toolholder 104 during machining operations. Still further, the direction of the cutting forces in the zero centerline configuration of the toolholder assembly 10 of the invention ensures that the joint or connection between the toolholder 104 and the tool spindle 106 is kept together.